

**WHAT IS CLAIMED IS:**

1    1. A method for operating a controller system connected to an inspection platform  
2    configured to perform an optical inspection process at a first degree of optical resolution and a  
3    plurality of optical inspection systems configured to perform an optical inspection process at a  
4    second degree of optical resolution, wherein each of the plurality of optical inspection systems  
5    is disposed at different locations on a substrate processing system, the method comprising:

6            receiving, from one of the plurality of optical inspection systems, process data readings  
7            comprising optical signal signature information indicative of a topographical condition on a  
8            substrate inspected by the one optical inspection system; and

9            processing the process data readings to determine a subsequent substrate handling step.

1    2. The method of claim 1, wherein processing the process data readings to determine the  
2    subsequent substrate handling step comprises:

3            determining whether the process data readings exceed a predetermined value;  
4            if the data readings exceed the predetermined value, determining that an unacceptable  
5            topographical condition exists on the substrate; and  
6            transferring the substrate to the inspection platform.

1    3. The method of claim 1, wherein the optical signal signature information comprises at  
2    least one of substrate reflectivity information, specular information, spectral information,  
3    substrate defect information, substrate damage information, particle contamination  
4    information, alphanumeric character information, non-uniform plasma deposition, and any  
5    combination thereof.

1    4. The method of claim 1, wherein processing the process data readings to determine the  
2    subsequent substrate handling step comprises determining whether to transfer the substrate to  
3    the inspection platform for further optical inspection.

1    5. The method of claim 1, wherein the subsequent process step is a process termination  
2    step.

1 6. The method of claim 1, wherein processing the process data readings to determine the  
2 subsequent substrate handling step comprises determining the location of the substrate in the  
3 processing system to determine a routing sequence for the substrate.

1 7. A substrate process inspection system, comprising:  
2 a plurality of optical inspection systems each configured to perform an optical  
3 inspection process at a first degree of optical resolution and each comprising a transmitter unit  
4 and a receiver unit;  
5 an inspection platform configured to perform an optical inspection process at a second  
6 degree of optical resolution; and  
7 a controller system connected to the plurality of optical inspection systems and the  
8 inspection platform and configured to:  
9 (i) process optical signal information indicative of a topographical  
10 condition on a substrate inspected by at least one of the plurality of optical inspection  
11 systems; and  
12 (ii) in response to the topographical condition, cause execution of one of a  
13 plurality of subsequent substrate handling steps, wherein a first substrate handling step  
14 comprises transferring the substrate to the inspection platform for further optical  
15 inspection.

1 8. The system of claim 7, wherein each of the optical inspection systems is disposed on a  
2 processing system along a transfer path of the substrate.

1 9. The system of claim 7, wherein the receiver unit comprises at least one of a charge-  
2 coupled device (CCD) camera and a spectrometer.

1 10. The system of claim 7, further comprising an input unit for inputting control  
2 information utilized to operate the controller system.

1 11. The system of claim 7, wherein the controller system is configured to cause execution  
2 of the first substrate handling step by:  
3 determining whether optical inspection data collected by at least one of the plurality of  
4 optical inspection systems exceed a predetermined value; and

5 if so, determining that an unacceptable substrate process condition exists.

1 12. The system of claim 11, wherein the optical inspection data comprises substrate  
2 reflectivity information, specular information, spectral information, substrate defect  
3 information, substrate damage information, particle contamination information, alphanumeric  
4 character information, non-uniform plasma deposition, and any combination thereof.

1 13. The system of claim 11, wherein if the unacceptable substrate process condition exists,  
2 the controller system is configured to initiate a system shut down sequence.

3 14. A processing system, comprising a cluster tool and an optical inspection system  
4 comprising:

5 (a) a plurality of optical inspection systems each comprising a transmitter unit and  
6 a receiver unit and each configured to perform an optical inspection process at a first degree of  
7 optical resolution and each disposed at different locations on the cluster tool;

8 (b) an inspection platform connected to the cluster tool configured to perform an  
9 optical inspection process at a second degree of optical resolution;

10 (c) a controller system connected to the plurality of optical inspection systems and  
11 the inspection platform and configured to:

12 (i) process optical signal information indicative of a topographical  
13 condition on a substrate inspected by at least one of the plurality of optical inspection  
14 systems; and

15 (ii) in response to the topographical condition, cause execution of one of a  
16 plurality of subsequent substrate handling steps, wherein a first substrate handling step  
17 comprises transferring the substrate to the inspection platform for further optical  
inspection; and

(d) an input device configured to allow operation of the controller by an operator.

15. The system of claim 14, wherein the cluster tool comprises a transfer chamber and a  
processing chamber connected to the transfer chamber and wherein at least one of the plurality  
of optical inspection systems is disposed on the transfer chamber and at least one of the  
plurality of optical inspection systems is disposed on the processing chamber.

1 16. The system of claim 14, wherein each of the optical inspection systems is disposed on a  
2 processing system along a transfer path of the substrate.

1 17. The system of claim 14, wherein the receiver unit comprises at least one of a charge-  
2 coupled device (CCD) camera and a spectrometer.

1 18. The system of claim 14, further comprising an input unit for inputting control  
2 information utilized to operate the controller system.

1 19. The system of claim 14, wherein the controller system is configured to cause execution  
2 of the first substrate handling step by:

3 determining whether optical inspection data collected by at least one of the plurality of  
4 optical inspection systems exceed a predetermined value; and  
5 if so, determining that an unacceptable substrate process condition exists.

1 20. The system of claim 19, wherein the optical inspection data comprises substrate  
2 reflectivity information, specular information, spectral information, substrate defect  
3 information, substrate damage information, particle contamination information, alphanumeric  
4 character information, non-uniform plasma deposition, and any combination thereof.

1 21. The system of claim 19, wherein if the unacceptable substrate process condition exists,  
2 the controller system is configured to execute a shut down sequence to remove the substrate  
3 from the processing system.